

## APPENDIX D - VEGETATIVE REPLACEMENT STANDARDS

The vegetation replacement standards are a compilation of information from many sources. The following list reflects the major sources of information used to develop the replacement and restoration standards:

**USDA :**

Natural Resources Conservation Service

Forest Service

Virginia Department of Conservation and Recreation

Virginia Department of Forestry

Chesapeake Bay Local Assistance Department

Conversations and emails with members of the Technical Committee.

Maryland Chesapeake Bay Critical Area Commission

Maryland Department of Natural Resources Forest Service

Pennsylvania Releaf

Local governments in Virginia and Maryland

VEGETATION REPLACEMENT RATES		
VEGETATION REMOVED	PREFERRED REPLACEMENT VEGETATION	ACCEPTABLE ALTERNATIVE VEGETATION
1 tree or sapling 1/2"-2 1/2" caliper	1 tree @ equal caliper or greater	<b>Or</b> 2 large shrubs @ 3'-4' <b>Or</b> 10 small shrubs or woody groundcover * @ 15"-18"
1 tree ≥ 2 1/2" caliper	1 tree @ 1 1/2" - 2" caliper, or 1 evergreen tree @ 6' min. ht., per every 4" caliper of tree removed (ex: a 12" cal. tree would require 3 trees to replace it)	<b>Or</b> 75% trees @ 1 1/2" - 2" and 25% large shrubs @ 3'-4' per every 4" caliper of tree removed. (ex: a 16" cal. tree removed would require 3 trees and 1 large shrub) <b>Or</b> 10 small shrubs or woody groundcover @ 15"-18" per 4" caliper of tree removed (ex: a 8" caliper tree removed requires 20 small shrubs)
1 large shrub	1 large shrub @ 3'-4'	<b>Or</b> 5 small shrubs or woody groundcover @ 15"-18"
* Woody groundcover is considered to be a woody, spreading shrub that remains close to the ground, to 18" high, such as a shore juniper, <i>juniperus conferta</i> . Vines may not be considered "woody groundcover" for the purpose of vegetation replacement.		

## RESTORATION / ESTABLISHMENT TABLE A

### Definitions:

Canopy tree: a tree that reaches 35 feet in height or larger when mature

Understory tree: a tree that matures to a height of 12 feet to 35'

Large shrub: a shrub that reaches 10 feet of height or greater at maturity

Small shrub: a woody plant that can reach up to 10 feet of height at maturity

### ¼ acre or less of buffer

Up to 10,890 square feet or less

For every 400 square-foot unit (20'x20') or fraction thereof plant:

*one (1)* canopy tree @ 1½" - 2" caliper or large evergreen @ 6'

*two (2)* understory trees @ ¾" – 1 ½" caliper or evergreen @ 4'

or *one (1)* understory tree and *two (2)* large shrubs @ 3'-4'

*three (3)* small shrubs or woody groundcover @ 15" – 18"

### Example:

A 100-foot wide lot x 100-foot wide buffer is 10,000 square feet.

Divide by 400 square feet (20'x20' unit) to get:

25 units

<u>Units</u> x	<u>plant/unit</u>	<u>Number of plants</u>
25 units x	1 canopy tree	25 canopy trees
	2 understory trees	50 understory trees
	3 small shrubs	<u>75 small shrubs</u>
		150 plants

## RESTORATION / ESTABLISHMENT TABLE B

### Greater than ¼ acre of buffer

More than 10,890 square feet

- A. Plant at the same rate as for ¼ acre or less.
- B. The waterside 50% of the buffer (from the waterline inland for the first 50 feet):  
For every 400 square-foot unit (20'x20') or fraction thereof plant:

*one (1) canopy tree @ 1½" - 2" caliper or large evergreen @ 6'*  
*two (2) understory trees @ ¾" - 1 ½" caliper or evergreen @ 4'*  
                     *or one (1) understory tree and two (2) large shrubs @ 3'-4'*  
*three (3) small shrubs or woody groundcover @ 15" - 18"*

#### **AND**

The landward 50% of buffer (from 50 feet inland to 100 feet inland):

either plant

Bare root seedlings or whips at 1,210 stems per acre<sup>1</sup>, approximately 6'x6' on center  
(Minimum survival required after two growing seasons: 600 plants)

**or**

Container grown seedling tubes at 700 per acre approximately 8' x 8' on center (Minimum survival required after two growing seasons: 490 plants)

- C. If the applicant is willing to enter into a five year maintenance and performance guarantee:  
100% of buffer planted with:  
Bare root seedlings or whips at 1,210 per acre, approximately 6' x 6' on center (Minimum survival required after two growing seasons: 600 plants)  
**or**  
Container grown seedling tubes at 700 per acre approximately 8' x 8' on center (Minimum survival required after two growing seasons: 490 plants)

### 1 acre or more of buffer

With an evaluation from an arborist or forester or other professional, natural regeneration may be an acceptable method of buffer establishment, however, a forestry management plan must be in place prior to any vegetation being removed. A minimum of 35 feet next to the water must be left in forest and protected prior to any vegetation being removed. If over 20 percent of the vegetation must be removed for the health of the woodlot, within the 35 feet closest to the shoreline, vegetation must be reestablished by seedling plantings at the rates above.

<sup>1</sup> Palone, Roxanne S., and Al Todd, *Chesapeake Bay riparian handbook: A guide for establishing and maintaining riparian forest buffers*. May 1977. p. 7-20.

